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## Auralising the Sublime:

### An Investigation into Creativity and Process in the Pursuit of Sonic Perfection

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**ABSTRACT:** This paper investigates the creative process in the production of modern musical designs, from initial concepts through to process realization and explores the notions of expression, creative-wellbeing and closure. At what point in the creative process may a work of Art be considered complete? Is a modern creative artifact, especially digital, ever truly finished? The work considers compositional design and intent and to what extent creative direction and coherence are meaningful initial considerations; should creativity be burdened with consideration of outcomes at the outset? Technology and creativity are very often bound together in the contemporary creative process; how do we manage the process to ensure that we satisfy our aesthetic compass and promote a direction of travel to a satisfying sonic destination? Prevalent theories of creativity, tools and techniques will be investigated that can be utilised to provoke often unanticipated, but nevertheless, rewarding results. The exploratory use of digital audio manipulation tools and chance operations are considered alongside more determinate predictable processes in order to elucidate the role of the unforeseen in the production of creative content. The authors will document their own collaborative work and provide perspectives on artistic case studies from the world of education, visual arts and music. The work will promote the direct integrated teaching of creativity in music production and composition classes developing applicable tools that may help to stimulate original thought and address creative blocks, evaluating whether cognition of the creative mechanism offers positive stimulation in seeking creative solutions in the musical production process.

*“Perfectionism is the voice of the oppressor, the enemy of the people. It will keep you cramped and insane your whole life... Perfectionism is a mean, frozen form of idealism, while messes are the artist’s true friend. What people somehow (inadvertently, I’m sure) forgot to mention when we were children was that we need to make messes in order to find out who we are and why we are here...” - Anne Lamott, from Bird by Bird (1980)*

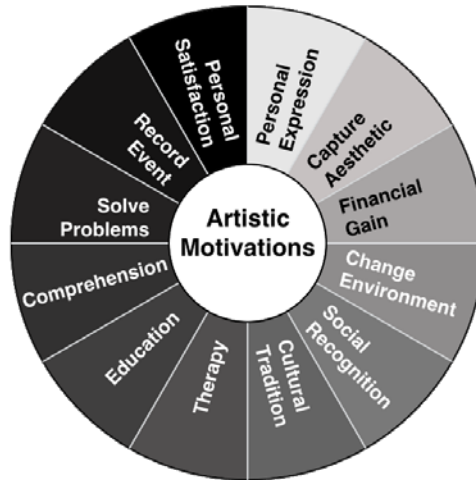
## INTRODUCTION

The focus of this paper is upon creativity within the arts with particular emphasis upon music. The primary objective is to offer insights and to develop procedural strategies for application predominantly, although not necessarily exclusively, within higher-educational environments. The working practices of professional and educational creators will be considered to derive a series of conceptual and practical *tools* that may serve to facilitate a satisfactory and productive creative experience. Two fundamental scenarios will be considered throughout the paper; the first will be the creation of new ideas investigating creative motivation, constraint, development and outcome. The second will consider the process of post-production within which pre-existing recorded materials are subject to creative arrangement, re-arrangement and processing. In both cases there are a multitude of potential outcomes with significant space to assert individual identity; fundamentally the product commercially will likely be the result of combined creative effort from inception of idea to final distribution artefact. Drawing upon insights gained from creative colleagues and undergraduate teaching, the work will consider to what extent pre-considerations and expectations are factors in determining creative trajectory. The study will consider five primary attributes that will form the basis of the discussion:

- Education
- Definitions
- Creative Domain
- Creative Theory
- Creative Strategies

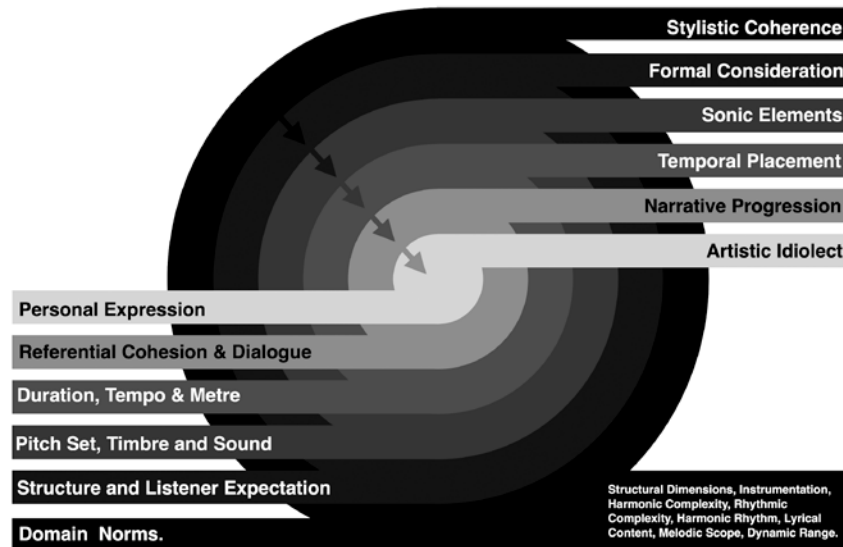
## GENESIS

Why would one be drawn to contemplate a creative act? There are a number of reasons that may be considered (see Figure 1), such as artistic need, desire or compulsion to communicate non-verbally; it may be for purely financial gain, an imminent assignment or perhaps there is an identified problem that requires a particularly individual solution; whatever the reason, without motivation there would be no creativity. Educationally all of the students encountered upon the author's programmes have already demonstrated a creative facility in the form of a portfolio of work:



**Figure 1 - Creative Motivations**

To what extent does understanding the nature of creativity benefit the creative process? This question is at the heart of this paper. When all is well and the creative ideas are *flowing* then there may be little need for such introspection; perhaps there is even a reluctance for looking too closely at a fully functioning intuitive process for fear of derailing the productivity and tainting the *magic*, since the feeling of inspiration, of which artists often speak with reverence, can be perceived to be an *external* rather than *internal* mechanism; in times past the sense of a *Muse* bestowing creative wisdom was an alluring notion elevating the artist into a privileged position whilst at the same time relieving him/her of creative responsibility. Understanding creativity, through reviewing significant artefacts or interrogating successful artists may very well offer significant insights into the conditions within which novel ideas arise, but can creativity be taught or at the very least enhanced? Creative subjects are invariably taught without any reference to creativity as an independent discipline. Students of music may be taught practical instrumental skills, developing performance repertoire, musical analysis engaging in exercises in harmony, counterpoint, arrangement, orchestration and various re-creative assignments, but the composer's creative strategies and the development of individual artistic expression (see Figure 2) are very often not directly addressed, particularly early on in the educational process. The development of a *sense-of-aesthetic* is to some extent left to chance and personal style tends to develop out of repetitive habits and discovery.



**Figure 2 - Traditional Compositional Characteristics**

Successful commercial music is not exclusively dependent upon the composer or performer abilities to produce new and marketable work; typically, it is a team of skilled musicians, producers, engineers and technicians who collaborate together to craft and refine the product. This culture of creative teamwork began in the music industry as far back as *Tin Pan Alley* with its songwriters and publishers and is manifested within the design and use of early recording studios such as *Abbey Road* in the 1930's, which was one of the first purposely built commercial recording studio that employed teams of producers, songwriters and technicians. The commercial creative process evolves through four stages that conceivably may overlap: 1. *Pre-composition* - may involve stylistic consideration or even calculations, 2. *Composition* - may be internalised idea or partially developed/improvised upon an instrument/s, 3. *Realisation* - The ideas are developed upon instruments, real or virtual, into a fully formed structure that is recorded, and 4. *Post-Production* - the performances are balanced, tuned, mixed and prepared for distribution. The hierarchical nature of the early *Abbey Road* recordings which generally involved songwriters creating the songs, producers guiding the performers and engineers operating the equipment, began to change in the 1960's as the recording equipment and mixing desks began to be used more creatively, sometimes as a result of fortuitous serendipitous behaviour. Much of the innovating popular music produced in the 1960's was the product of experimentation utilising tape-loops and effects processing, informed by the avant-garde experimental classical traditions. During this time, the delineation of roles between producer, musician and technician became less clear; these roles are, to some extent, now interchangeable particularly with the advent of affordable home studio facilities and computer generated instruments: Collaboration within commercial music production is still a significant feature feeding and maintaining the creative workflow. Sawyer and DeZutter (2009) outline the importance of group creativity research, "*a wide range of empirical studies has revealed that significant creations are almost always the result of complex collaborations*"; whereas the significance culturally, or otherwise, of commercial musical production might be debatable, the mechanisms of distributed creative practices are certainly worthy of investigation. Students of sound engineering, faced with creatively mixing multiple sound-files, may be taught (see Figure 3) the physics of sound, the

mechanics sound editing/processing along with critical listening skills to allow the development of consistent perception and appropriate sound treatments.

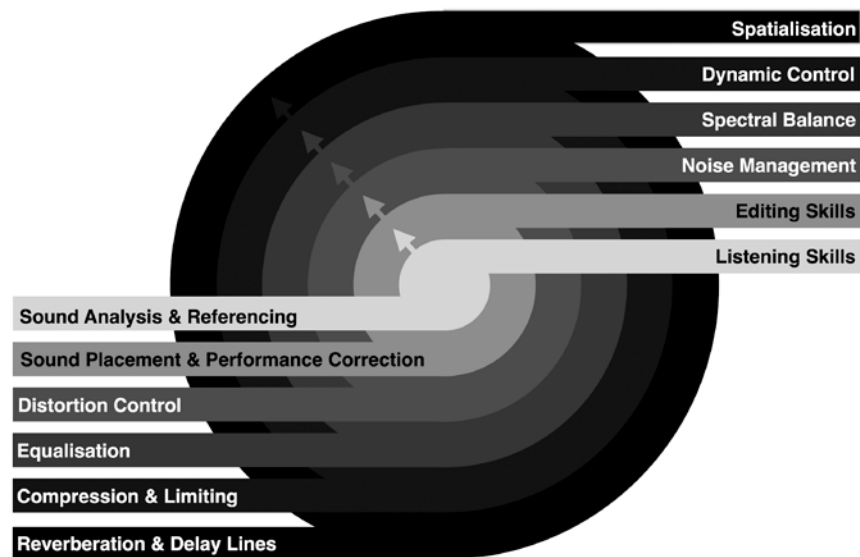


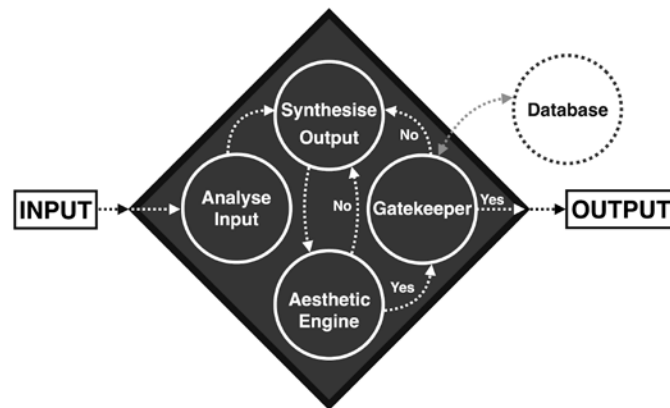
Figure 3 - Post-Production Characteristics

Common stylistic characteristics are absorbed through comparative studies of musical constructs and imitative exercises conforming to norms of behavioural expectation. A common activity would be the re-creation of classical recordings to determine the ideal behaviours and learn the available tools. In assessment it is often easier to identify the errors in application, uncharacteristic deviations from the normal, rather than determine and validate individual musical expressions that may be an indication of a particularly unique interpretation.

### MISSING IN ACTION

Definitions can initially seem obvious but sometimes provide new insights and perspectives into creative activities and stimulate creative potential; this is where this study will begin and indeed where the authors both begin their respective classes in creative study to determine what is captured and what is missing from such definitions. What is Music? Music is inherently a multi-sensory experience; we *hear* in space, we may *see* or associate in our imagination a causal source, we may *feel* objective resonance and create internal narratives to support emotional constructs, guided by expressed extra-musical identities. Given this, how should music be defined and what would be the benefit of such a definition? Perhaps to offer illuminating insight and provide meaningful constraints for creative focus? A typical dictionary definition offers: "*the science or art of ordering tones or sounds in succession, in combination, and in temporal relationships to produce a composition having unity and continuity*" (Merriam-Webster's *Collegiate Dictionary*, online edition), which presents the obvious dominant characteristic and compositional preoccupation as naturally *sound*; regular patterns in which ideally result in listener coherence and sustained interest. In a conventional sense, we might reasonably define music, in terms of this sonic attribute alone, as simply '*organised sound*'; the definition although seemingly superficial is satisfying since it is open and all-embracing of musical space, as was intended when Edgard Varése

similarly expressed it (Goldman 1961, 133) when discussing his own aesthetic sensibilities in relation to his recent excursion into multi-speaker tape composition: *Poème électronique* (1957-58). What is composition? A sonorous creative act, idea, performance or recording that might be considered new and valuable. To achieve value, this could involve be a transformation in an existing stylistic domain or the establishment of a new one that achieves cultural recognition. Alternative organisational designs in music we will call *style*, to mean the accepted *norms* of a musical period or individual. *Style* then in music refers to the common attributes and behaviours within a musical form; in any given *style*, certain features are considered normal and others anomalous. All sound may be considered *musical*, which is the virtue of the above definition, but in each culture musicians tend to admit only a subset of acceptable sounds, frequency arrangements, combinations and temporal patterns, into sonic expression. There may be no single intercultural definition of music and the boundary between musical sounds and noise may be culturally blurred. Varèse speculated (Goldman, 1961) upon the future of music “*the score of the future would need to be seismographic in order to illustrate their full potential*”, citing the definition of music given by Józef Maria Hoene-Wroński: “the corporealization of the intelligence that is in sound”, as being particularly influential in shaping his musical imagination.



**Figure 4 - Music Logic Machine**

Music could dispassionately be regarded as an abstract sonic temporal construction, constrained by pre-formed elements organised in predefined relationships; a product perhaps more of *discovery* than invention, that might conceivably be determined or computed. Permutations and combinations of acceptable outcomes might be calculated and selected according to stochastic design (see Figure 4). From this perspective, mechanised musical culturally verified artefacts might be fabricated or synthesised according to audience requirements for expectation, consistency, coherence and originality.

Educationally it is not uncommon to study the *craft* of composition by learning the characteristics of archetypal work, through systematic analysis codifying behaviours tested through re-creation; creative motivation and method is somewhat less often addressed and there are other important peripheral attributes of musical expression and experience *missing* from the analysis, that may offer new perspectives and valuable insights such as:

- The creative process: which is very likely non-linear; does music have to be experienced along a fixed timeline?

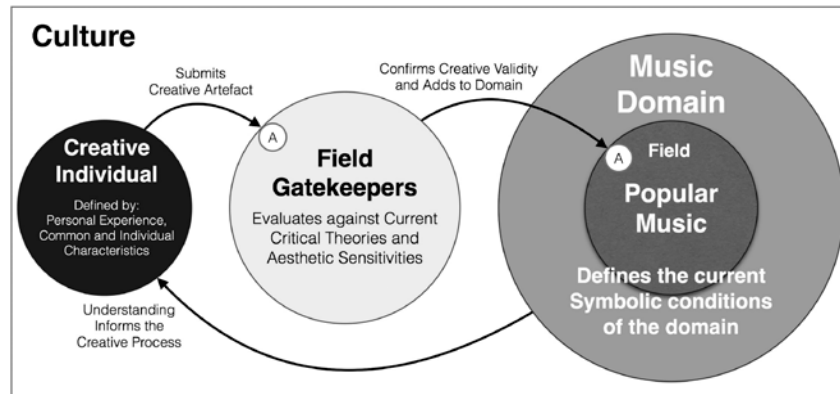
- The communication and expression of emotive design through dynamic physiological gestures in performance; music has at times been considered a language with linguistic syntactical structure (see Bernstein, 1990). The imprecision within the symbolic representation (notation) is also profitable for performers, allowing for expressive individual interpretation.
- The tactile sensations of performing/composing upon instrument, sensing and responding to the resonant vibrations within a space. Each performer has individual muscle memories and patterns of behaviour that may be meaningfully codified outside of sound.

If we could transform and translate our perspectives, music might be qualified in other ways; Varése experienced such an epiphany (expressed in the Lewiston Daily Sun, 1936) when listening to a Beethoven symphony: *“I became conscious of an entirely new effect produced by this familiar music. I seemed to feel the music detaching itself and projecting itself in space. I became conscious of a third dimension in the music”*.

## **NOVELTY AND COHERENCE**

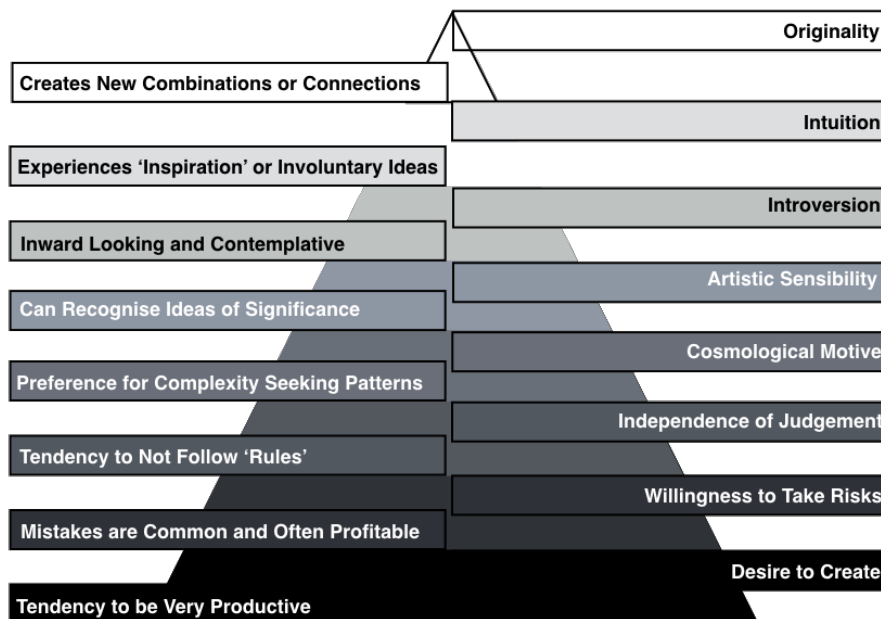
In order to be creative, it is clearly important to understand to creative domain within which creativity is to take place. Given the self-imposed limitations, music remains a system of sufficient complexity to allow for combinatory and sequential variation accommodating novelty, identity and meaning. According to Csikszentmihalyi (1996), a creative artifact requires a context within which it is created and reviewed (see Figure 5). The artist learns the *rules* of the creative domain, ensuring audience coherence, and then arranges the elements in new ways maintaining artistic consistency. The completed artefact is then offered to the *gatekeepers* to verify its validity and uniqueness to be added to the domain database. Innovation in music however, requires more than mere *novelty*; the newness must have a context for it to be validated by the domain gatekeepers, as Frank Zappa said (Zappa, 1989): *“Without deviation (from the norm), ‘progress’ is not possible...In order for one to deviate successfully, one has to have at least a passing acquaintance with whatever norm one expects to deviate from”*. Does understanding the creative process make creativity more or less likely? If it can be accepted that creativity is indeed a process, a way of operating, then it is conceivable that it can be learned or enhanced as a skill. As a fundamental component of undergraduate studies within creative subjects the authors have integrated sessions upon *creativity* as a particular discipline into all levels of creative academic engagement; the objective is to introduce the notion that attending to creative thought processes could be profitable in seeking a solution to a presented problem, which is frequently defined as an assignment brief in the form of a commercial commission. A common assignment brief would be to compose or post-produce music according to given stylistic constraints to satisfy a particular function.





**Figure 5 - The Creative Domain, adapted from Csikszentmihalyi (1996)**

Many of students frequently encountered have already demonstrated a capacity for producing creative work on some level, so a part of the study is to identify creative traits and behaviours that may already form a part of their individual identities (see Figure 6). Behaviours that are regarded as profitable may also be adopted those that are not can perhaps be reduced. The challenge is to express the creative process in a directly applicable form or translate prevalent theories in ways that are meaningfully applicable.



**Figure 6 - Creative Characteristics, adapted from Barron (1969) and Guilford (1988)**

What is actually meant by creativity in this context? From a compositional perspective the objective is to produce new music; for post-production the outcome should be a unique mix of sounds; both products however are required to be functional. Newness and uniqueness are not objectives to be pursued in preference to coherence. Absolute novelty as a creative objective is not to be considered a beneficial trait in an environment in which listener comprehensibility is paramount. Performer identity and self-expression are only meaningful if the artist has consistent, repeatable, traits that are different enough from other artists to be desirable but similar enough to be familiar. These behaviours can prosper in

systems that have sufficient complexity to allow multiple solutions but with enough syntactical structure to allow coherence. How does the artist know that something original with value has been produced that also satisfies the need for comprehensibility? Fundamentally coherence is determined through comparisons with other like products; this may receive a validation of authenticity from an audience or a search approval from a database. In the case of composition this is particularly relevant to be certain that there are no copyright infringements. Composition and the post-production process involve to a large extent the selection and arrangement of known elements in acceptable ways; what is *acceptable* is largely governed by convention and experience. What is also sought as a part of the process is the accommodation of significant but *attractive* differences in interpretation representing the identity of the creative individual. An original idea needs then to satisfy the requirements of the stylistic domain (see Figure 7), appeal to the listeners and pass the scrutiny of the gatekeepers. Expert creators have a tendency for overly complex solutions, that make use of years of experience and knowledge, often overlooking the more simple solutions that might be more accessible to the novice creator. A common strategy for the *expert creator* is to induce a more naive perspective of the domain through the use of self imposed constraints as expressed by Stravinsky (1942) “... *my freedom will be so much the greater and more meaningful the more narrowly I limit my field of action and the more I surround myself with obstacles.....The more constraints one imposes, the more one frees one’s self of the chains that shackle the spirit.*”

A perennial anxiety is where to begin? Assuming *inspiration* (however this is defined) is not forthcoming and the outcome of the creative act is governed by particular imperatives, as is common within education or the commercial world, how is the creative process invoked and maintained? Even with ordinarily self-assured individuals there may be periods of creative block where there is a sense of expressive paralysis because the projection of imagined *perfection*. This experience is particularly resonant for students about to embark upon a significant piece of assessment that will ultimately be subject to a critical review. If the outcome has assumed an exaggerated importance in the mind of the potential creator then fear of doing the wrong thing and attracting a negative response, or fostering a focus upon an idealised outcome or even an idealised response to an imagined outcome before the first step has been made can prove ultimately inhibiting; as American composer Aaron Copland (1959) expressed it as follows: “There is the fear of being wrong, plus the insecurity of not being able to prove that one is right, even to oneself”. How might one circumnavigate the experience of creative block? Frank Zappa (1989) was typically dismissive of qualitative responsibility when offering advice for prospective composers:

*Just Follow These Simple Instructions:*

1. Declare your **intention** to create a “composition.”
2. **Start** a piece at **some time**.
3. Cause **something to happen over a period of time** (it doesn’t matter what happens in your “time hole” – we have critics to tell us whether it is any good or not, so we won’t worry about that part).
4. **End the piece at some time** (or keep it going, telling the audience it is a “work in progress”).
5. Get a part-time job so you can continue to do stuff like this.

Joly in (Guildford 1977) suggests that two parallel thought processes have to occur to achieve creativity. The first process being a psychological one of overcoming inhibitions such as existential anxiety or the personal hindrance of lacking confidence, and the logical application of well-defined action processes by following intuitions based on carefully chosen techniques and methods adapted to a specific scenario. In higher education, the focus tends to be on the second process of technique rather than the ability to overcome inhibitions. If students are to become creative, both individually and as part of a group, it is important that they become confident in their creative output. This can be difficult in a student cohort who do not share common musical tastes and students may feel exposed to ridicule if they attempt to steer the group towards a specific musical genre. One possible creative 'ice breaker' to enhance confidence amongst students is to remove all genre specific considerations by asking students to create musical soundscapes based on pictorial cues. This task builds upon Vygotsky in Lindqvist (2010) who considered art as a mixture of emotion and imagination by using creative cues that suggest both emotion and expansive imagination. In the task, groups of students are provided with a set of images that clearly show human faces expressing different emotions and another set that depict abstract art or landscapes. The groups must choose one image from each set to then create a musical soundscape to compliment the images within a time frame of two hours. In practice, this technique has proven useful to newly established cohorts as musical soundscapes are abstract works that are genre neutral. It has been shown that this approach encourages students who are not adept in instrument technique to contribute ideas as frequently as others who can play more expressively as sound effects and textures are of equal validity to creating an immersive listening experience. The process encourages collaboration amongst the student group and greater creative output will become the accepted descriptive social norm of that group (Berkowitz, 2004). This positive approach to creative output, where members of a group openly support each other as opposed to anxiety over expressing ideas in a student group has meant that they have been allowed to accelerate and widen their creative output. This provides a 'quick win' to convince the students of the benefits of a more creative approach and to keep possible dissenters from being too influential (Baillie, 2006). As students will be encouraged to use creativity skills early on in their academic journey, the amount of ideas generated and the time of incubation could mean that associative creativity would occur more frequently (Mednick, 1962). Once students have become more cohesive and confident in their creative output, a similar exercise using extracts of poetry and asking students to create songs or soundscapes can be used.

## **CREATIVE THEORIES**

An integral component of music classes are incorporated sessions on creative thinking. Classic domain-general models of the creative process such as by Wallas (1926), Koestler (1964), Guilford (1967), Baron (1969) and Sternberg (1999) are discussed to raise awareness of potential common creative mechanisms and a consideration as to how this knowledge might be applicable in specific disciplines.



**Figure 7 - A Creative Process, adapted from Wallas (1926) and Young (1965)**

The fundamental objective in this undertaking is to offer meaningful and applicable insights into the creative process and consequently encourage the student to take greater control over their personal creative activities. It is not difficult to imagine how one might apply the above model (see Figure 7) to music production. 1. *Preparation* - Listen to music stylistically focussed and widely diverse; also read widely and take notes, 2. *Exploration* - consider how the various music, ideas might be related, 3. *Incubation* - Do something unconnected and try not to focus upon work, 4. *Illumination* - record the ideas and 5. *Verification* - review and evaluate ideas. What is difficult is to guarantee a result or to predict a realisable timeline for the advent of the *illumination* stage. Bruner (1962) states that the sensation of illumination is often perceived as a combinatorial surprise: *“An act that produces effective surprise is the hallmark of the creative enterprise.”* He defines three ways in which surprise might be revealed: Predictive, Formal and Metaphorical; Predictive is the application of experience in an established creative field; the surprise in this case may be only appreciated in reflection. Formal is a result of a discovery within a field in which combinations previously considered unconnected now appear to be so. Metaphorical is when connections are made between two different fields of activity but produce a satisfying and unexpected union. The objective of these sessions is to offer provocations into creative process but the extent to which *domain-general* theories can have a meaningful impact upon the productivity and successes of a specific set of creatives is uncertain (Baer, 2012); nevertheless, the sessions are generally very well received and do promote very positive discussions of productive attitudes and practices although, tests of creative potential (Kim, 2006) rarely yield any meaningful insights into the creative musical potential. A common initial conception that arises out of student discourse is that creative states of mind are inaccessible without some form of inspirational intervention and as such the study of creativity may not be directly beneficial; this perspective for some results in potentially redundant timetabled laboratory sessions within which the creative artifacts that are requested are not immediately forthcoming. This is compounded by the observation that much research into creativity is often preoccupied with the study of examples that transcend the boundaries of the domain, whereas musicians generally wish to refine that which defines creative identity which depends to a large extent upon repetition of behaviours. It is interesting to note that when students are invited to share personal work that is regarded as fundamentally a result of inspiration, no examples offered have ever been realised without a stylistic context. All work was stylistically framed by experiential conditions within a familiar domain. As observed by David Byrne (2012) *“I had an extremely slow-dawning insight about creation. That insight is that context largely determines what is written, painted, sculpted, sung, or performed”*.

## REVELATIONS

When student composers are left to *create* according to their own designs and motivations, what often results are creative reinventions that are to a large extent demonstrations of skill and a statement of social identity. Familiar workflow is invoked utilising tried and tested patterns, timbres and harmonies within comfortable software or environments that have resulted in past successes, either commercially or academically. Why would one not resort to experiential skills and knowledge that has been developed perhaps over a number of years? is it not their right to make use of the very characteristics that define their individual expressions? Sometimes this expression is irrevocably associated with physical gestures upon a musical instrument or particular piece of equipment as a result of potentially many years of learning technique and repertoire (or patterns of behaviour). Creative decisions are made then according to a sense of aesthetic confirmation, producing work to suit known stylistic designs that will achieve a satisfactory outcome. The work is constrained to a great extent by expectation and imagination which are both governed by experience; creativity in this case would likely involve variation within the boundaries of stylistic consistency. Meaningful variation is commonly achieved through *inspiration* (involuntary ideas steered by musical intuition that arrive in the mind of the creator), or through improvisational, sometimes collaborative, chance discoveries. There may be of course be many different levels of creative achievement that will either correspond or transcend stylistic boundaries. Irrespective of the motivational reasons or processes of creative discovery it is common for outcomes to be governed by limitations or constraints of design inherent in the expression.

Musical and production limitations may be educationally designed to similarly increase focus, relieve anxiety and to some extent creative responsibility as to where to begin in a compositional task; failure then is not so inhibiting nor is closure as the exercises can be time limited:

- Limited number of instruments or tracks
- Limited instruments or tools
- Collaborative working
- Partial solutions offered
- Fusion of Styles
- Complete freedom in one dimension but constraint in another

The word 'constraint' in this context is not intended to be negative. When complete freedom is offered in an assignment, students seem naturally inclined to repeat past successes through operational conditioning. The exercises are designed to render re-creation is less likely and creativity a consequence. As a result the student is forced to solve a problem using unfamiliar criteria that may inevitably result in novelty, at least from the perspective of the student, and may reveal some hitherto unknown characteristic of the subject or process. There are generally six outcomes from implementing such constrained exercises:

- *Compliance 1* - accept limitation and develop novelty within constraint
- *Compliance 2* - try to recreate within constraints. Find the familiar within
- *Compliance 3* - but with *negotiation*; student accepts limitation up to a point then negotiates additions or inclusions which may include multimodal considerations
- *Negotiation* of new boundary conditions at the outset - testing the constraints

- *Inactivity* - demotivation and frustration
- *Complete non-compliance*... Disregard or oppose guidance

The objective is to provoke the student into an exploratory mode within which they may discover new perspectives that stimulate creative ideas. New ideas for the student may be assimilated in a number of ways: 1. *Substitution* - where an old practice element is replaced, 2. *Incorporation* - where the new practice is added, 3. *Redefinition* - where the whole creative approach is reconsidered as a result of the new ideas, and 4. *Development* - where the student takes the new ideas and develops them even further. Not all students benefit, some find it ultimately easier to reject the new ideas and revert to older more successful practices.

The Beatles and George Martin created unique recordings by using a very limited palette of effects to manipulate recorded sounds and primarily used audio tape to achieve it. They would speed up recordings or layer multiple overdubs stacked to create a fuller sound and also explored new processes to manipulate and enhance the recorded sound, such as phasing, flanging, ADT (auto double tracking). It is clear from various interviews given by Martin, that they felt liberated by the freedom that tape-based manipulation effects had given them but, in fact, they were operating within a walled garden because of the inherent limitations of the technology. Is that the paradox of creativity, the illusion of freedom within a cage? Stokes (2005) recognised that masters of their domain only become creators when they impose novel constraints on their output; she suggested that progress can be made in a project by augmenting and developing the positive features whilst simultaneously diminishing the negative.



**Figure 8 - Aesthetic Dialogue, adapted from Stokes (2005)**

One of the greatest inhibitors to creative output in a modern recording environment is perhaps having no technical constraints. As Goldbeck (1949) expressed it: “The composer’s chords are every dead or living composer’s chords, never his own. His paper is never a blank, there are so many staves on it, five prison bars in each, History and Tradition being the jail...”. It is very often more productive in modern recording environment to agree the constraints on the product at the beginning of any project. The setting of boundaries reduces the time taken to experiment in unproductive ways and leads to more cohesion of thought between producer, engineer and artists. From personal experience of the authors, the idea of recording a wide variety of random ideas and then evaluating their impact on creative output without any agreed constraints leads to frustration amongst the production team. There are many stories of artists spending thousands of pounds and significant recording studio time experimenting, attempting to find the perfect combination of musicians, instruments and phrases that would make their recording complete only to find the the exponential complexity of such a task overwhelming. Constraints provide some linearity to the creative process in the recording studio and having clearly shared ideals can also promote collaborative creativity amongst the production team.

How do we know when a worthwhile discovery has been made? How do we know which strands of investigation to develop and which to discard? Is it possible to evaluate the potential of success early on in the creative process? Is the creative instigator the best person to make this judgement and at what point should the judgement be made, if at all? Educator and artist *Sister Corita Kent* was clear to differentiate between creativity and critique within *Some Rules for Students and Teachers*, a list established as a part of a project she taught in 1967-1968 at LA's Immaculate Heart Convent college:

*Rule 8: Don't try to create and analyse at the same time. They're different processes.*

Leonard Cohen (quoted in Zollo. 2003) poetically expresses his perspective upon making a creative evaluation too soon in the process: *"The cutting of the gem has to be finished before you can see whether it shines."* This idea of idea generation and evaluation being separate and distinct processes in creativity has been defined by Osborn (1993) during 'brainstorming'. This technique can be applied to the music production process. Idea generation should be confined to the recording stage and evaluation of ideas during the mixing or post production stage. In an educational environment, although the idea of adopting these techniques for music creation can feel to students as inhibitor to inspiration, the opposite has occurred. In practice the author's have found that by adopting these techniques during recording sessions, it encourages group creativity and reduces creative anxiety amongst students who feel that due to their perceived lack of ability cannot be in any way be creative as they feel they can contribute at least partly to a musical product.

How do we know when a work of art is complete? It may be, as often is the case, that the deadline arrives as Pixar animator, director and producer Pete Docter said (see Usher, S.,2010) when quoting colleague John Lasseter: "Our films don't get finished, they just get released." Deadlines can be very useful devices that may be also internally administered since it can be difficult, especially if working within digital media to declare a work complete. Time and money constraints can be very meaningful motivators to complete work but artistically is the work ever finished? Music producers Müller and Wyner (2017) extol the virtue of taking breaks stating *"Fatigue is the enemy of objectivity"* and suggest seeking the opinion of qualified others. *"If I can't make something better, don't do anything"* says Wyner, without qualifying what *better* actually means, but suggesting not that the product may be *perfect* but has evolved as far as possible within the constraints of equipment, his skill-set and/or musical ability within the performance. In the recording studio environment, it is important to separate the processes of recording and mixing (post production) and to have a break in between as this can aid objectivity during mixing. It is very common for creators of music to become so involved in their project that they find it difficult hear it as someone who has not heard the music for the first time. Their focus is often skewed towards areas that required the greatest amount of skill or exertion on their part rather than the overall experience that melody, instrumentation, phrasing and production creates in the listener. In post production, a technique that draws on the necessities of time constraints, the need to remain objective in mixing decisions and the desire to produce the best work possible can be adopted. During the mixing stage, there will be many passages in the music that can be identified to need adjustment such as balance of instruments, depth of the soundfield or how close or distant an instrument may seem and the listeners focus at any one point in the musical passage. It is important

that after a significant break between the recording process and the mixing stage, on first listen, the production team creates a list of immediate and obvious adjustments that are required. This first listen will be the most objective and closest on how the production will be heard by a listener unfamiliar with the work. When working through the list of adjustments, other problems may be identified however they should be evaluated on overall improvement to the listening experience and the constraints of time. Once the adjustments have been made and list has been exhausted, the mix can be considered as complete as possible in that time frame. There may be for some advantages in a work never being completed as hinted at by Yoko Ono (see Richardson, 2007): *"I always believed that my work should be unfinished in the sense that I encourage people to add their creativity to it, either conceptually or physically."* The acceptance of a never completed work is a characteristic that is useful as it does not inhibit the creation of new work. Understanding that a work is the best it can be whilst working to constraints moves the focus back to new idea generation of new material.

## CONCLUSION

Artists may wish to consider their work a free and individual expression unfettered by audience expectation or priori considerations; this is for some a significant motivator; artists are inspired by great works and successful creative minds of the past, but ultimately seek to express a personal, unique and resonant message. To what extent are artists bound by prior structural conditions? expressive, technical or otherwise and is there any virtue in raising awareness of these features? How does one learn to create art? It is not uncommon for students to validate their creative ideas by asserting its expressive credentials or declaring it as a product of the free imagination; but products of inspiration are invariably never outside the domain with which the artist is associated. There may be aspirational ideals that steer the expressive voice to explore more remote domains but to what extent may the product regarded as *authentic*. Within artistic educational institutions students are indoctrinated through studying the work of past masters, to develop technique and absorb philosophies; this is initially achieved through, environmental exposure, structured observing/listening and technical imitation, encouraging the students to secure identity and ownership in the pursuit of increasingly idiosyncratic approaches developing a personal expressive voice. How does this work in practical terms? It may involve, in particularly enlightened institutions, the consideration of the creative space within which play and experimentation is encouraged. Csikszentmihalyi (1996) states that *"it is easier to enhance creativity by changing conditions in the environment than by trying to make people think more creatively"*, nevertheless creativity is a process, a way of thinking than can be enhanced through the adoption of certain identified behaviours, and awareness of the mechanisms of GReacreativity may ultimately diminish the inhibitors to it. Csikszentmihalyi (1996) also states that *"genuine creative accomplishment is almost never the result of a sudden insight, a light-bulb flashing on in the dark, but come after years of hard work"*.

The authors have attempted to heighten awareness within the undergraduate population of the creative process and its mechanisms, to produce an model (see Figure 9) of its operations that invoke a series of practical and applicable strategies. The fundamental model is threefold involving: 1. *Inspiration* - where the creative process (see Figure 7) is activated, 2. *Exploration* where the student access a toolkit containing a series of provocations and 3. *Experimentation* - where the student is encouraged to invite



*extra-musical* features into the process. Throughout the process the students are encouraged to reference the outcome aesthetically developing a sense of what is stylistically appropriate.

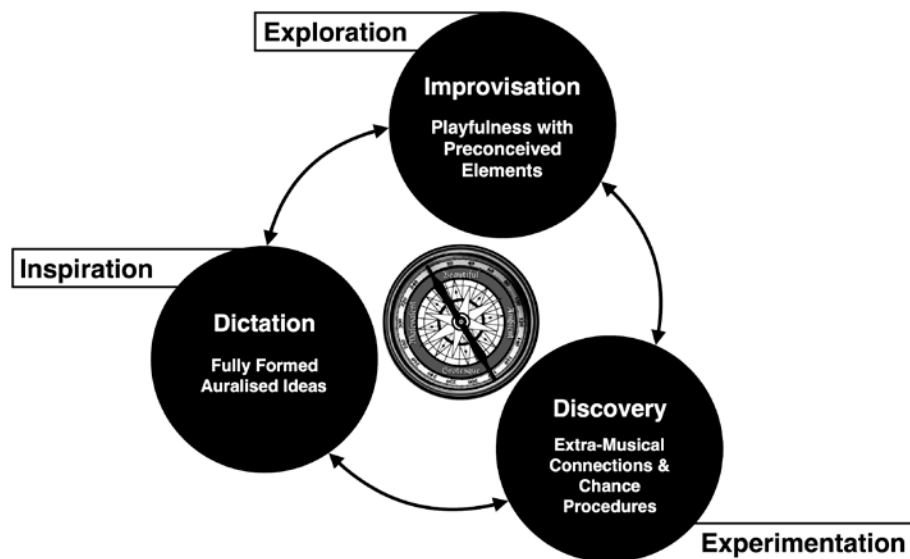


Figure 9 - Aesthetic Compass

It may be too soon to evaluate whether such lessons in creativity will have a meaningful and lasting impact upon the futures of undergraduate students in music and music production, but the lessons are very well received and the students report the benefits of the activity; the work will continue.

*"It may be that when we no longer know what to do,  
we have come to our real work,  
and when we no longer know which way to go,  
we have begun our real journey.  
The mind that is not baffled is not employed.  
The impeded stream is the one that sings."*

"The Real Work" by Wendell Berry, from *Standing by Words*. ©1983

### **Authors' Brief Bios**

*Michael Brown* is the Programme Leader for the BA (Hons) Music degree programme within the School of Arts, at the University of Derby in the UK. He holds diplomas in Art and Music, a BSc (Hons) degree in Software Engineering, Mathematics and Music, and a Master's degree in Contemporary Composition, which combine to serve his interest in computer creativity. He is a researcher within the school with over twenty-five years of teaching experience, an active artist, composer and musician. His principal research interest is in the area of creativity; he has collaboratively investigated relevant theories and developed applicable strategies, in relation to the Arts and particularly Music, for implementation professionally and educationally. He has over the past few years explored a variety of related strands of investigation and has disseminated his findings on multi-modal creativity in Europe and the USA where he is an active member of the American Creativity Association. Ostensibly his core objective is to assemble a body of work that constitute a *toolkit* of applicable creative approaches that serve to offer

insight into the creative process and potentially help to cultivate environmental conditions within which creative ideas may be more forthcoming.

*David Paterson* is the Programme Leader for the BSc(Hons) Audio Engineering degree at the Perth College campus of the University of the Highlands and Islands in the UK. He holds a BSc degree in Audio Engineering and a Masters in Education. David has extensive music industry experience and has collaborated in many successful projects over twenty-five years as an engineer and producer for many record companies and broadcasters. He has industry recognition as a producer winning UK best blues album and a nomination in the prestigious Mercury Music Prize. As an academic, David's interests are in developing and nurturing creativity within a studio environment amongst musicians and his students. He is exploring the development of possible frameworks that encourage creativity that can be adapted by both musicians and sound designers. He has also researched into the pedagogical benefits of remote audio connections between distant campuses. He is exploring the development of possible frameworks that encourage creativity that can be adapted by both musicians and sound designers.

*Chris Wilson* works in the Centre for Learning Innovation and Professional Practice at Aston University, a globally renowned higher education institution and the UK's leading university for business and the professions. He is a classically trained musician and practitioner in the technological arts with degrees in music and philosophy, has presented and published internationally on the subjects of creativity, artistry, technology and education, including the book *Making Projects Sing: A Musical Perspective of Project Management*, and is a Senior Fellow of the Higher Education Academy. With over two decades of teaching experience in higher education and expertise across a range of subjects, Chris has managed the delivery of staff development and professional recognition programmes at leading UK universities, lead institutional level projects including implementation of learning and teaching strategy, and currently leads a number of teacher education projects working to promote creative practice in higher education.

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